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ASSESSING NATIONAL GUARD READINESS TO RESPOND TO WEAPONS OF MASS DESTRUCTION TERRORIST EVENTS

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ABSTRACT

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There continues to be discussion about the military's readiness to assist civil authorities in response to weapons of mass destruction (WMD) incidents. Some suggest that the new demands of homeland security are so significant that total reorganization of the National Guard is required. Others cite the National Guard's long history of supporting traditional military missions, homeland defense and consequence management as proof that major reorganization is not necessary. This paper proposes that scenario-based analysis provides a method to help ascertain and achieve required levels of readiness. Broad, unsubstantiated assumptions and conclusions have not provided enough specificity or rationale for meaningful decision making. This paper discusses the traditional role of the National Guard in homeland security and the probability of a WMD terrorist event. The paper then proposes a scenario-based model that analyzes the probability of specific WMD usage and its potential impact on the civilian community. From this model, one can identify military missions unique to WMD consequence management. Analysis can then determine specific readiness deficiencies and recommendations for corrections. In this paper, the terrorist use of a radiological dispersion device (RDD) is modeled to illustrate the concept of scenario-based readiness planning. The paper concludes with specific recommendations to improve military readiness for response to RDDs.

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Since the events of 11 September 2001, there has been increasing concern about the country's ability to manage the consequences of terrorist incidents. Of particular concern are events that require complex responses such as events in which Weapons of Mass Destruction (WMD) are used. However, the debate regarding U.S. homeland security and the proper role of the military, specifically the National Guard, predates 11 September 2001. With little evidence, some have concluded that only through complete reorganization can the National Guard meet the homeland security challenges of the future. Others argue that little reform is needed to meet the task. This paper proposes that a scenario-based planning and evaluation model provides a method of ascertaining the readiness of the National Guard to perform WMD consequence management.

This paper proposes a scenario-based model that requires an analysis of the probability and impact of a specific WMD event. From this analysis, specific military activities can be identified. Readiness is determined based on: (1) the capability of National Guard elements to perform those specific response activities and (2) the ability to perform operations in a contaminated area without compromising the health of the force. It is important to note that the assessment of the readiness of units specialized in WMD response is beyond the scope of this paper. The model proposed in this paper will deal exclusively with the readiness of non-specialized National Guard forces to provide support to federal, state and local agencies in the event of a WMD incident.

Historically, the probability of a WMD event was considered so unlikely that few, if any, federal or state resources were devoted specifically to preparing the National Guard for WMD event consequence management. Because all solders have some WMD defense training and equipment, it was perceived that additional resources were neither necessary nor justified. However, in the 1990's, and again following events of 11 September, the United States re-evaluated the threat of terrorist acquiring and using WMD. In response to the Nunn-Lugar-Dominici Act (1996) National Guard Civil Support Teams-Weapons of Mass Destruction (CST-WMD) were authorized and funded.[1] The number of teams authorized has subsequently increased, and now all states and territories are authorized at least one team.[2] With this exception, federal and state resources have rarely been devoted specifically to National Guard WMD consequence management preparedness. However, a perceived increase in the threat of terrorist use of WMD has resulted in a re-evaluation of this policy. Additional resources should be devoted to this mission to the extent that the probability of an WMD event has significantly

increased and focused on activities the National Guard is expected to perform that are different from the activities that the National Guard has performed in past consequence management operations. As such, this paper proposes that broad statements regarding the current level of readiness of the National Guard cannot be made without evaluation of specific scenarios to determine the weapons probability of use, impact, and expected National Guard consequence management support activities.

THE NATIONAL GUARD'S ROLE IN HOMELAND SECURITY

Currently, the role of military assistance to federal, state and local authorities is articulated in laws, executive orders, and several response plans. These documents are helpful in defining roles and responsibilities and in providing an operational framework in which agencies can operate. However, on their own, they lack the specificity necessary to determine if the military, or other agencies, is ready to respond to WMD events. The February 2001, the Hart-Rudman Commission issued its third report, *Road Map for National Security: Imperative for Change* which recommended: "The Secretary of Defense, at the President's direction, should make homeland security a primary mission of the National Guard, and the Guard should be reorganized, properly trained, and adequately equipped to undertake that mission."[3] Although rather innocuous sounding, the recommendation raises, but does not answer, the key questions in the debate. Namely, is it necessary, or even practical, for the National Guard to drop its current primary mission of providing combat ready units for overseas military operations such as war fighting, peace keeping etc. to prepare for, and perform, homeland security operations? When the Commission recommends that homeland security become *a* primary mission, is the implication that it must actually become *the* primary mission? What is the scope of the reorganization, training and equipment necessary for the National Guard to perform homeland security functions?

Historically, the National Guard has provided ready units for the war fight, provided homeland defense, and provided assistance to civil authorities in managing the consequences of disasters, civil unrest, terrorist events etc. The National Guard performs these roles in three different duty statuses. Operations performed under Title 10 (T-10) of the United States Code are those operations in which National Guard units are mobilized for federal service and operate under the command and control of the Active Component of the Army or Air Force. Soldiers called to active duty under Title 32 (T-32) of the United States Code are called to federal duty but remain under the command and control of a Governor. Soldiers called to state active duty

are called under the authority of state law, are paid by state government and are under the control of the Governor.

Events following the attacks of 11 September illustrate these different duty statuses. Thousands of National Guard soldiers were called to T-10 duty under the President's partial mobilization authority to service in Afghanistan or in the United States to provide security at key infrastructure, military installations, etc. Additionally, over four thousand members of the National Guard were called to active duty under T-32 to provide airport security. Airport security was a federal mission paid for by the federal government but utilizing decentralized execution under the command and the control of the Governors. Title 32 offers more flexibility during execution because it allows more task force tailoring in terms of specialty and number of personnel, as well as, more variation in the number and length of individual tours than T-10 status. Also, T-32 does not require Presidential mobilization authority and the complex, time-consuming mobilization process demanded by T-10 duty. Additionally, during this period over 7,500 members of the New York Army National Guard (ARNG), primarily on state active duty status, performed consequence management support following the attacks on the World Trade Center. State active duty affords the most operational flexibility to local officials in terms of the number and specialties of the soldiers and the length of duty of different soldiers and elements. Also, *Posse Comitatus*, a federal law prohibiting federal military forces from participating in law enforcement activities, does not apply in state active duty or T-32 status. As Michael Doubler reports:

> The New York ARNG's participation in consequence management operations resulted in a number of important lessons learned. New York's senior leaders agreed that mobilizing and deploying troops in a state active duty status allowed the maximum degree of flexibility required to meet such an extreme and unprecedented situation. Mobilizing Guard members in a federal, T10 status would have impeded the ability to tailor task forces for specific missions and reduced the state's overall agility in meeting demands that shifted dramatically on a daily basis. Guard soldiers on state active duty were not subject to the restrictions of *Posse Comitatus* and were free to operate with law enforcement agencies….Controlling headquarters must possess the ability to satisfy immediate requests for special equipment and personnel with special skills and rush them to the point needed.[4]

Compare that experience with the experience of response to the 1992 Los Angeles Riots when the National Guard was federalized after being called to state active duty in support of local law enforcement. The federal military bureaucracy and *Posse Comitatus* so restricted federalized National Guard that requests for support dropped from 100% of requested tasks being accomplished to only 20% of requested tasks being accomplished.[5]

> A new level of bureaucracy is introduced with federalization that can thwart deployment of troops. Under this *modus operandi*, whenever the National Guard liaison received the initial assignment for the [Los Angeles Police Department] LAPD or the LA County Sheriff's Department, the liaison contacted the U.S. Army liaison officer. The Army officer then referred the request to the U.S. military's Joint Task Force. Frequently the Joint Task Force would request more information regarding specifics of the mission. It then would decide whether the federalized troops should become involved…. Federalization obviously changed the relationship between the National Guard and the LAPD. Before federalization the Guard troops were completely supportive of agencies' efforts to deal with the disturbance.[6]

Despite the immediacy and flexibility of response state active duty offers, there are some negative aspects compared with T-32 or T-10 military response. State government must incur all the initial expenses without any assurances of when, or if, the federal government will reimburse them. Also, pay and benefits for state active duty are not always equal to those on T-10 or T-32 status, creating inequities between soldiers participating in the same operation on different duty statuses. Third, only the National Guard can operate in a state active duty status. Therefore, if requested military capabilities rest outside the National Guard, a rather cumbersome process must be initiated to bring in Active or Reserve soldiers into the operation. Additionally, state government may be reluctant to allocate and pay for National Guard to assist federal agencies, such as the Federal Bureau Investigation. Title-32 status avoids many of the obstacles of state active duty while retaining much of the operational and legal flexibility. Unfortunately, there is currently no mechanism to immediately authorize and allocate federal funding for T-32. In their fiscal year 2004 priorities, the National Guard Association of the United States opposed homeland security call-ups under T-10 because they have "a negative impact on solder training, interferes with the effective force management of the states' military personnel, and prevents certain personal accommodations of solders' and civilian employers' special needs during the term of the soldiers federal service."[7] The Association favors call-ups for homeland security missions under T-32.[8] As stated above one of the reasons T-32 is preferred for homeland security missions such as airport and infrastructure protection is that it allows flexibility and rotations so that soldiers can continue military training through out the mission. This status helps mitigate the perceived conflict between traditional military preparedness and homeland security. Despite the advantages and disadvantages, the current operational structure has met the emergency response needs of the nation in the past.

The National Guard and other military organizations operate only as back up and augmentation to local responders such as the fire department, law enforcement and civilian medical agencies. In that sense, National Guard units have never been expected to perform at

the same level of specialization or with the same immediacy as these first responders. The White House reiterated the traditional role of military responders, as back up and augmentation to local responders, in the July 2002 *National Strategy for Homeland Security*. Doubler summarizes:

> Rather than military assets, the new strategy placed intelligence agencies, law enforcement and first responders in homeland security's first line of defense. The new strategy defined four major homeland security missions for [the Department of Defense] DOD: the conduct of air and naval operations to defend U.S. territory; consequence management following major emergencies; security missions of 'limited scope' in support of other federal agencies; and protection of the nation's critical infrastructure.[9]

Despite the new emphasis the nation is putting on homeland security, the military response mission is not significantly different than it has been over the history of the country.

Some believe that preparation for, and participation in homeland security tasks distracts from preparation for military tasks to the point one organization cannot prepare for both. As one author states:

> However in its present state of training readiness, the National Guard is unable to perform many homeland security support tasks, while its combat tasks do not directly support civil assistance. In the future, the Army National Guard should change and build organizations that support civil authorities for homeland security. Such a transformation includes dedication of military organizations to the sole mission of supporting civil agencies in domestic security.[10]

This view was also reflected by retired Air Force COL Randy Larsen, Director of the ANSER Institute for Homeland Security while testifying before the Senate Governmental Affairs Committee in November of 2002.[11] Noting that limited training time is consumed with preparations for war fighting he stated: "They are not ready for homeland support as well fighting foreign wars."[12] Neither author offered examples of specific homeland security tasks that the National Guard is required, but unable to perform.

Senator Feinstein of California and other Senators have introduced the "Guard Act of 2003" which, among other provisions, requests that the states develop plans on how they intend to use the National Guard in homeland security operations.[13] Identifying state requested missions seems like an obvious first step in determining and improving readiness, yet, despite debate and opinions there has been very little systemic attempt to identify missions based on state and local planning. The National Governors' Association, the Adjutants General Association of the United States, the National Guard Association of the United States and the Hart-Rudman task force have endorsed Senator Feinstein's bill.[14] The issue remains, when one reviews the specific tasks involved in homeland security, it is not clear that the task are that

fundamentally different, or that they require so much time, that one organization can not be prepared to participate in either traditional military missions or consequence management depending on the needs of the nation. A review of specific tasks should provide insight into the extent that National Guard preparation and participation in homeland security conflicts with readiness for traditional military missions.

Although clearly a given unit or individual cannot particate in both operations at the same time, all evidence indicates that they can participate in operations sequentially with success. The National Guard has always been considered large enough to provide necessary units for domestic operations while still providing units for traditional military roles. This paper does not deal with the size of the National Guard to meet mission requirements, although there is reason to believe that with a force of over 350,000, the Army National Guard has adequate forces to provide individuals and units required for overseas military and domestic operations. In fact, all but three states (CA, UT, HI) have entered into the National Guard Emergency Management Assistance Compact. [15] Under this agreement, National Guard units and soldiers from other states to be temporarily assigned to a state where a disaster has occurred. In that way, Governors have a sufficient pool of military responders to draw upon, even if a significant number of their own National Guard soldiers and airmen are deployed overseas performing traditional military operations. Likewise, units needed to support an overseas mission can be drawn from a state not intensely engaged in consequence management. The shear number of units in the National Guard allows flexibility in choosing an available unit for the mission at hand.

Even if it was desired or somehow necessary for the National Guard to participate primarily or exclusively in homeland security, it is impractical. In 1999, the DOD released the *Reserve Component Employment 2005 Study*. The study called for the creation of various types of Reserve Component units tailored to conduct homeland security operations and recommended they be attached to a Joint Headquarters. The reports conclusions faced great skepticism particularly because there were no funds available for such an ambitious reorganization of the military.[16] Neither the Army nor the Air Force can afford to lose access to National Guard assets for overseas military operations. The ARNG represents over half of the Army's combat power and loss of these units to the Army's overseas military operations represents an extreme risk to our national security. Moreover, it seems unlikely that the Congress or the American people would accept the cost of expansion of the Active and Reserve Force to compensate for the loss of ARNG combat and support units.[17] In fact, it is the federal military mission that accounts for the ARNG's current high operating tempo. As of February 2003, 30% of the available ARNG was either on alert or mobilized. Of the soldiers mobilized,

48,000 soldiers were participating in traditional overseas military operations. While 19,000 were performing domestic duties, 17,756 on T-10 duty for Operation Noble Eagle and 1,956 on state active duty. It is important to note of the 17,756 soldiers on T-10 duty for Operation Noble Eagle, most are providing security, many at military installations.[18] With proper scheduling and rotations, the soldiers may actually have more military training opportunities than they do in their armories. If soldiers were to perform security duty on T-32 status, there would be even less military training interruption. Only a portion of the soldiers on state active duty (1,956) are participating in consequence management, many with temporary duty for a few weeks due to winter storms. In fact, with the exception of the World Trade Center attack of 11 September, state active duty for consequence management rarely lasts more than a few weeks. Given the current low probability of a catastrophic terrorist attack, the cost of reorganizing, retraining, reequipping both the entire National Guard and the rest of the Army and Air Force seems unjustified. Efforts to reform should be in proportion to the risks and the reasonably anticipated response requirements.

PROBABILITY OF WMD TERRORIST EVENTS

Experts on terrorism note that historically terrorists have seldom used WMD. However, emerging trends indicate that constraints against the use of WMD are eroding. Some feel that the terrorist use of WMD is inevitable. In her book *The Ultimate Terrorist*, Jessica Stern identifies five interrelated developments that increase the risk of terrorist using WMD.[19] "First, such weapons are especially valuable to terrorist seeking to conjure a sense of divine retribution, to display scientific prowess, to kill large numbers of people, to invoke dread, or to retaliate against states that have used these weapons in the past. Terrorists motivated by goals like these rather than traditional political objectives are increasing in number."[20]

Secondly, Ms. Stern notes that the number of terrorist groups motivated by religious ideology rather than traditional political objectives is increasing. Traditional terrorist groups such as the Irish Republican Army or the Palestine Liberation Organization have secular goals, which tend to limit the violence they will inflict. In *Inside Terrorism*, Bruce Hoffman states:

> For the religious terrorist, violence is first and foremost a sacramental act or divine duty executed in direct response to some theological demand or imperative. Terrorism thus assumes a transcendental dimension, and its perpetrators are consequently unconstrained by the political, moral or practical constraints that may affect other terrorist. Where as secular terrorist, even if they have the capacity to do so, rarely attempt indiscriminate killing on a massive scale because such tactics are not consonant with their political aims and therefore are regarded as counterproductive, if not immoral, religious terrorists often seek the elimination of broadly defined categories of enemies and

> accordingly regard such large-scale violence not only as morally justified but as a necessary expedient for attainment of their goals.[21]

According to the Rand-St. Andrews Chronology, in 1995 religious groups committed 25 percent of terrorist incidents recorded, but were responsible for 58 percent of deaths by terrorist. Because religiously motivated terrorist do not feel traditional political and social constraints that limit fatalities, these groups are more likely to pursue and use WMD.

Third, the breakup of the Soviet Union raises concerns about terrorist acquiring nuclear weapons, radioactive materials, component parts, and scientific and technical expertise.[22] Security and personnel reliability programs are relatively lax in the former Soviet Union. Thousands of tactical nuclear weapons are protected only by padlocks and often financially desperate guards.[23] Additionally, a number of highly educated and trained government research personnel are without employment or are grossly underpaid. The temptation of high salaries could lead some to assist terrorist states and terrorist groups. Stern reports that there have been at least eight thefts of materiel that could be used to make a nuclear weapon.[24] The United States has a number of programs that assist Russia in safeguarding nuclear weapons, radiological materials, biological weapons and scientific expertise. However, significant risks still remain.

The fourth reason Ms. Stern believes the risk of terrorist use of WMD is increasing is the fact these weapons are proliferating, including in some states that support terrorism. She notes that Russia, China and North Korea export dual-use equipment. That is equipment that can be used for legitimate commercial or scientific purposes or to develop WMD offensive capabilities. She states that Iraq is a state that has chemical and biological weapons and also supports terrorism.[25]

The final reason for increased risk of the use of WMD is that advances in technology have made it easier to develop and use weapons of mass destruction.[26] Communications technologies such as the Internet help recruit terrorist and exchange other technical and operational information. Additionally, it is easier to develop the weaponized agents themselves. For example, biological weapons can be developed more easily with advanced fermenting equipment that makes it easier to control the growth medium. Because of advanced scientific technology, biological weapons can be coated with microorganisms that make it easier to disperse the agents.

Despite these unfortunate trends, Ms. Stern believes that the probability of terrorist successfully using WMD remains low. Few terrorists have the capability or the motivation to kill thousands.[27] As Anthony Cordesman points out, it is virtually impossible to predict the likely

hood of a large-scale terrorist event using either statistical modeling or scenario analysis. He states:

> Ironically, these realities do not support either those who argue that [Chemical, Biological, Radiological or Nuclear] CBRN attacks are unlikely or those who argue that they are inevitable. Those who argue that today's identifiable threats from state actors, terrorist, and extremist present a clear and decisive rationale for extensive homeland defense programs dealing with CBRN attacks are stretching the evidence beyond its limits. At the same time, those who argue such programs are not necessary on the grounds that such threats cannot be clearly and decisively identified ignore very real risks. It would be much easier to shape U.S. programs if this were not the case.[28]

However, as several authors have noted, although the probability of a WMD attack may be low, the potential consequences could be so devastating that significant attention to prevention and consequence management may be warranted.

Despite the ambiguity of the risks, most experts agree that resources should be devoted to consequence management even for certain low probability events. Weapons of mass destruction events have the potential of inflicting such terrible consequences in terms of loss of lives, loss of cities or entire city blocks, loss of public trust in government etc, that consequence management deserves planning attention and resources. In other words, risk management is the combined factors of probability and outcome. However, this still provides little guidance for determining the requirements and appropriate resource levels to achieve needed readiness. The necessity and cost of risk mitigation (readiness) must be viewed within the context of probability and outcome of specific events.

A catastrophic WMD event has not been used in this example of scenario-based modeling because, currently, there is so little planning done for those scenarios that it would be difficult to derive conclusions and recommendations.[29] Since the military performs only a support and augmentation role, little valuable information can be drawn without viewing military readiness within the context of broader multi-agency planning efforts. The scenario-based model of a radiological dispersion device (RDD) being offered is intended primarily to outline an approach for determining priorities and readiness. It is not intended to replace more detailed planning with federal, state or local agencies. In that respect, it is intended to illustrate the model, not to be either comprehensive or proscriptive. The following is an analysis of the probability and consequences of a RDD.

RDD EVENT SCENARIO; DEFINITION, PROBABILITY, IMPACT

DEFINITION OF A RDD

There are a number of weapons that may be categorized as a radiological dispersion device. The Department of Justice states that a radioactive dispersion device is a device intended to deploy radioactivity for malevolent reasons.[30] The devices are not capable of producing a nuclear yield. A "dirty bomb" is a type of radiological dispersion device that combines a conventional explosive such as dynamite or a truck bomb with radioactive materials. Alternatively, an explosive device may be placed next to existing radioactive source such as a radioactive waste storage site. Although less dramatic, a canister of radioactive isotopes placed in the ventilation system of a building also falls into the category of a radiological dispersion device. Title 18, USC 2332a categorizes any device that is designed to release radiation or radioactivity at a level dangerous to human health as a weapon of mass destruction.[31] Despite this legal definition, many consider a "dirty bomb" as a weapon of mass disruption rather than a weapon of mass destruction.[32]

PROBABILITY OF AN RDD EVENT

Although one of the least likely battlefield weapons,[33] an RDD is one of the more probable WMD terrorist events. First, the terrorists have training and experience in making and using conventional bombs and explosives. Modifying a conventional bomb is less of a scientific and technological leap than design, production and deployment of biological or chemical weapons. Second, many terrorist events conducted by the al-Qaida terror network have involved use of suicide bombs. Whether this delivery system is preferred based on theological ideology, or for some other reason, a "dirty bomb" fit more closely with the terrorists' operational pattern than chemical or biological weapons. It is technically and scientifically difficult to combine a conventional explosive with a chemical or biological agent. The heat of the explosion normally destroys most of the agent, as may have been the case with the first bombing of the World Trade Center in 1993. Some, but not all, experts are convinced that the terrorist had placed sodium cyanide in the truck bomb but that it was destroyed in the explosion.[34] Radiological source materials cannot be destroyed by heat and therefore lend themselves more readily to al-Qaida's weapon of choice; the suicide bomb.

Access to radiological materials may not pose the same difficulty as other WMD materials. The U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Technical Guide 238 lists the sources and descriptions of radiological sources in medical, research, and

industrial use.[35] There are a large number of sources of ionizing radiation potentially available to terrorist. Medical and industrial sources of radiation are most common in industrial countries although high-level nuclear waste can be found in many countries around the world.[36] In the U.S. alone, there are over 2 million hospitals, laboratories and factories using radioactive materials.[37] The federal government has regulatory control mechanisms in place that require the accountability and proper disposal of medical and industrial radioactive isotopes. However, since 1986, the Nuclear Regulator Commission has recorded over 1,700 instances in which radioactive materials have been lost or stolen.[38] The General Accounting Office estimates that between 1955 and 1977 there are thousands of kilograms of fissile materials for which there is no accounting.[39] Although probably a result of accounting errors, the lack of effective controls is a disturbing indicator. This is especially true when one considers the extreme sensitivity of fissile materials and the fact that this materiel was under the control of the government rather than private businesses, hospitals and laboratories.

The threat of terrorists acquiring radioactive materials from the former Soviet Union is also disturbing. The *Washington Post* reports:

> Radioactive materiel for such a bomb can be found in almost every country, including the United States. But terrorists looking for bargains could hardly do better than the former Soviet Union. The Soviets are known to have produced tens of thousands of radioactive devices for uses ranging from medical diagnostics to military communications, and many were simply abandoned after the Soviet breakup in 1991. Some regions are so littered with devices that published tourist guides caution travelers to watch out for them.[40]

The article goes on to describe the conditions in the former Soviet Republic of Georgia. To date, the Russians have not provided documentation of radioactive devices in Georgia so estimates of the scope of the problem vary widely. It is believed that there is anywhere from 100 to 1,000 unaccounted for Gamma Kolos devices alone. The original purpose of this device was to increase crop production by exposing seeds to radiation.[41] These devices would be extremely attractive to terrorists as they contain highly radioactive cesium-137 in fine powder form. This easily dispersed materiel emits gamma radiation and has a half-life of 30 years. As a result of accidents and black marketeering, the former Soviet Republic of Georgia has initiated an extensive search of former Soviet military installations and other likely locations for such radioactive sources. Several highly radioactive devices have been discovered, however only about 15% of the country has been covered to date.[42]

The United States has spent billions of dollars to help secure or destroy Soviet nuclear weapons and nuclear submarine fissile materiel. Since the events of 11 September the program has been expanded to include nonfissile radioactive materiel.[43] However, local efforts are still hampered by a lack of funding and the enormity of the task. Radioactive sources and material are often small and benign looking and have been left without markings in the vast countryside and among the many building abandoned with the fall of the Soviet Union. Although smuggling arrests have been made as a result of a sting operation, there is little comfort in the fact that boarder guards make between $30-50 a month and smuggling of all types is common along porous borders of the former Soviet republics.[44] In November 2001, during Congressional testimony, Rose Gottemoller testified that:

> Since 1993, the [International Atomic Energy Agency] IAEA has tracked 175 cases of trafficking in nuclear materials and 201 cases of trafficking in radioactive materials used for medical and industrial purposes. Of all these cases, however, only 18 involved small amounts of plutonium or highly enriched uranium, the 'weapons usable' material that is required to make a nuclear bomb.[45]

Later in November of 2001, Turkish police in Istanbul arrested two men trying to sell weapons-grade uranium for $750,000.[46] The men, apparently amateurs, said they had bought the materiel from a Russian.[47] Although suitable for a nuclear weapon, such highly radioactive materiel would more likely be used in a "dirty bomb", as few terrorists would have the sophistication necessary to design and develop a true nuclear weapon even if they possessed weapons-grade material.

Although there are a number of potentially available sources of radioactive materiel that may be suitable for a "dirty bomb", there is still significant deterrence from a terrorist use of the weapon. In addition to the obstacles presented in the acquisition of the materiel, the radioactive materiel must be fashioned so that it is usable for a bomb. In December 1999, the Gilmore Commission reported the following information:

> There are a number of possible sources of material that could be used to fashion such a device, including nuclear waste stored at a power plant (even though such waste is not highly radioactive), or radiological medical isotopes found in many hospitals or research laboratories. Although spent fuel rods are sometimes mentioned as potential sources of radiological materiel, they are very hot, heavy and difficult to handle, thus making them a poor choice for terrorists. Other sources, such as medical devices, might be much easier to steal and handle. These materials, however, have a much lower specific activity than materials in reactor fuel rods (although large unshielded sources are quite dangerous). Presumably, terrorist could steal a device (either in transit or at the service facility or user location) and remove the radioactive materiel. Radioactive materials are often sintered in ceramic or metallic pellets. Terrorist could then crush the pellets into a powder and put the powder into an RDD.[48]

Although not specifically mentioned in the report, there is some controversy about the practicality of a terrorist unshielding the radioactive materiel and grinding the pellets into a powder that can be dispersed in an explosion. Direct exposure to the radioactive materiel during processing and handling may cause the terrorist to become so ill he cannot complete his terrorist mission. Although today it is a common safety practice to use solid pellets of radioactive material in medical and industrial equipment, there are still countless older, abandoned devices through out the world that contain radioactive materiel in powder form. A source, such as the Gamma Kolos in the former Soviet Union, which is already in powder form, would provide significantly less risk to terrorists during handling and emplacement.

In addition to the obstacles of acquiring the radioactive materials and fashioning them into a weapon, there is the additional obstacle of delivering the device to the point of destination without detection. Besides the traditional law enforcement and security defenses to protect against bombs and explosives, terrorists using radioactive materials must also contend with the telltale signature of radiation. RDD's are easier to detect than conventional explosives devices, because most of these radiation sources cannot be completely shielded from detection equipment. New York Police Department supervisors wear "radiation pagers" which can alert the wearer when radiation readings reach a certain pre-designated level. Also, U.S. Customs personnel use hand held scanners to detect and intercept unauthorized radiological shipments entering the U.S.[49] Despite these efforts, some U.S. officials feel controls at the ports are inadequate and better sensors and more cargo tracking is required.[50]

Despite substantial challenges, terrorists have demonstrated an interest in RDD's. In 1995 Chechen separatist left about one ounce of cesium-137 in a Moscow park. A member of the group notified the media, and the cesium was recovered without incident. Although there was no risk to human health, the terrorists were successful to the extent the event generated a considerable amount of local and international media coverage and interest.[51] In 1993, operatives for bin Laden tried, but failed, to make a black market purchase of South African enriched uranium.[52] In June of 2002, the United States Department of Justice announced the arrest of an American who had returned from an al-Qaida training camp where he had received explosives training.[53] Reportedly, this individual was ordered to build and detonate a "dirty bomb" in a U.S. city. It is unknown if the suspect would have been successful in actually acquiring the materiel and building an effective bomb.

In conclusion, the threat of a "dirty bomb" explosion may be relatively low. However, the threat is certainly more credible than the use of a nuclear weapon or an improvised nuclear device.[54] The materials to construct a RDD are more readily available and the technology to

build the explosive is unsophisticated compared to that of an actual nuclear weapon that can create a nuclear yield. Similarly, the use of an RDD does not require the high level operational, scientific and technological departure for the terrorist as the development and use of chemical or biological weapons requires. Although terrorists might not be able to achieve the same level of lethality as with other types of WMD, they could achieve considerable psychological and physical impact at a fraction of the costs and risk of other WMD.

IMPACT OF AN RDD

One of the greatest difficulties in estimating and anticipating the potential impact of a RDD is that planning scenarios vary greatly. In 1999, the Gilmore Commission used an illustration of a RDD/truck bomb destroying the World Trade Center and resulting in radioactive contamination that renders the financial district in Manhattan indefinitely unusable.[55] Although such a weapon is feasible, most discussions of the risks of RDDs involve terrorist developing smaller weapons. However, the impact of even more modest RDD's can be considerable in both the short-term and the long-term. Experts disagree about the consequences projected in the scientific modeling. Some scientists believe the impact might actually be less than that currently being discussed.

One planning scenario developed by the Federation of American Scientist (FAS) examines the possible effects of distribution of Americium, a widely used industrial materiel, using one pound of TNT.[56] The FAS states that people in an area ten times as great as the initial bomb blast would require medical supervision and monitoring. In a larger area, approximately one kilometer long and twenty blocks wide, people would have to be evacuated within the first half hour.[57] After the passage of the initial radioactive cloud, others would have to be evacuated, but not necessarily with the same urgency as those close to the initial blast area. Under this scenario, FAS states that a region two kilometers long and covering sixty city blocks would be contaminated in excess of Environmental Protection Agency guidelines.[58] In another hypothetical case model offered by FAS, 1.75 ounces of cesium from the former Soviet Republic of Georgia is exploded in Washington, D.C. In this scenario there is an area of significant contamination for 20 miles near the explosive. Additionally, there is a cigar-shaped area of lesser contamination of over 90 miles downwind of the explosive. Areas of lesser contamination do not pose an immediate threat of radiation sickness. However, continued exposure to the contamination could pose a long-term health threat of cancer or genetic mutation. Costs of decontamination of a significant area of a city would run into billions of

dollars and may not be cost effective. Some buildings, including those of great cultural or historical significance, may have to be either destroyed or abandoned for decades.

It should be noted that models are controversial because there are so many assumptions, variables, and unknowns when modeling the effects of ad hoc or improvised weapons. Planning becomes even more difficult because there is not a medical consensus on the impact of low-level radiation on human health. Because the impact of an RDD can vary from merely a nuisance to a major event, most scientific models cannot legitimately be called predictive.

However, some conclusions can be reached about required emergency response if a sizable RDD was used. Under more difficult scenarios, there will be a need to evacuate some of the city, either immediately or after the radioactive cloud settles (approximately 24 hours depending on the characteristics of the radioactive agent and the weather). There will be some casualties that require medical attention for either trauma or radiation exposure or both. There will be a need to secure an area of the city to prevent further exposure and the spread of radioactive contamination. Traffic control will be extremely difficult because citizens, even those not at immediate risk, will wish to leave the city. There will be a need to survey and decontaminate citizens, as well as vehicles, coming out of the contaminated areas. Some citizens will be at least temporarily displaced, requiring shelter, food and other basics. There may be a need to handle and processes contaminated human remains, as well as, disposal of bird and animal remains.[59] Some food and water sources may be contaminated.[60] Despite these rather grim prospects, most experts agree that a RDD is primarily a psychological weapon and that controlling panic may be the most important aspect of consequence management.

MILITARY TASKS IN RESPONSE TO AN RDD

The military is requested in a consequence management scenario if local civilian responders find their resources overwhelmed by the enormity of the task. There can be little doubt that a sizable RDD would overwhelm local civilian responders and that the military would be asked to assist. Military response would come first from in-state National Guard assets. If those were insufficient in either size or capability, the state may enact the emergency compact and request National Guard assets from other states. The state also has the option of requesting, through the Federal Emergency Management Agency, that active or reserve military assets be sent to support in a T-10 status. Through this system, states theoretically can bring the capabilities of the entire military into the operation. To some extent, the state loses immediacy and control flexibility when requesting federal military assistance.

For the purposes of brevity only RDD scenario generated task that vary from traditional National Guard support functions will be discussed. Since security, traffic control, transportation and logistics support are common support functions they will not be discussed in detail although they are very relevant for local planners. This paper will discuss only two activities that are unique to RDDs and are not common task for the military to perform in support to civil authorities or on the battlefield. The functions to be discussed are: (1) personnel survey and decontamination of the citizenry and (2) retrieval and disposition of contaminated human remains. In addition to these unique tasks, the RDD offers the challenge of performing routine duties in a radiologically contaminated environment. In that sense, readiness is not based solely on the ability to perform task, but also on the ability to operate safely in a hazardous environment.

PERSONNEL RADIATION SURVEYS AND DECONTAMINATION

As stated earlier, fear of radiation and the ensuing panic in the civilian population may be the most difficult challenge for emergency responders. Although the appropriate response to a RDD would likely require the civilian community to "shelter in place" until the radioactive cloud has settled, there is some doubts about the citizenry's willingness to comply. Nevertheless, authorities will need to set up areas to survey individuals once they have been evacuated from contaminated areas. Personnel surveys and decontamination will assist in reducing exposure to radiation, reducing the spread of radiological contamination, and to help determine which citizens require medical surveillance, including bioassays, to monitor for radiation sickness or long-term health effects such as cancer. Because radiological decontamination largely consists of removing and changing clothes and shoes, the logistics burden of decontamination may not be as great as with other WMD.[61] However, because of extreme fears of radiation, it is anticipated that the number of citizens requesting surveys for radiological exposure will be several times greater than the number actually exposed. In this sense, the burden of screening and decontamination is not in the activity itself, but in the large numbers of citizens who were not exposed seeking reassurance.

Expectations of radiological fears overcoming the citizenry are based primarily on two incidents. One is the Chernobyl nuclear reactor accident in the Ukraine in 1986[62] the other is the accidental contamination of the civilian population of Goiania, Brazil in 1987.[63] During the Goiania accident, junkyard scavengers opened a piece of discarded medical equipment and exposed 3.5 oz of cesium-137. Within four weeks, four people died and 249 people were found to be internally or externally contaminated. The general population of the town demanded that

they be surveyed with radiation detection equipment. Over 112,000 residents were eventually surveyed for radioactive contamination.[64] Obviously, the ratio of people demanding surveys to the number actually exposed was extremely high. Given that a RDD exploded in a dense urban area could expose thousands not hundreds, official might be expected to screen millions of residents. Following the accident in Chernobyl, "radiophobia" became so intense that many citizens, including some in neighboring countries, purchased dosimeters and radiological detection instruments although they had no idea how to operate them.[65] Some citizens of the Ukraine demanded bioassays (blood test) every 10 days.[66]

Given the lessons learned from these past scenarios, it seems highly likely that state and local officials will request that military personnel set up stations to provide personnel surveys using hand held radiation detection instruments. Although standard issue military equipment can be used to conduct personnel surveys, the large numbers of individuals requesting surveys could make the complete reliance on such equipment impractical. Whole body surveys using standard radiation detection equipment take at least 2-3 minutes per person.[67] Assuming that over 90% of citizens requesting surveys may have no radiation contamination, it may be prudent to evaluate the potential use of Gamma Portal Monitors as a pre-screening tool. Walk-through detection portals are an example of equipment that may not be necessary for battlefield operations, but may prove invaluable for homeland security consequence management. Potentially, over 90% of the workload could be avoided by using portals to determine which individuals require a full body survey. However, with the exception of CST-WMD, few, if any, pieces of equipment have been purchased specifically for the National Guard homeland security mission.

RETRIEVAL AND DISPOSITION OF CONTAMINATED HUMAN REMAINS

It is likely that a RDD event would not produce more fatalities than local agencies could handle. In fact, most of the fatalities, if any, would probably result from the initial explosion rather than from radiation exposure. The level of training civilian personnel have to protect themselves from radiation contamination while handling human remains probably varies based on jurisdiction. However, the scenario brings up an interesting dilemma for emergency response planners - the National Guard has no mortuary affairs units.

The Army Reserve has several these units, including one that was mobilized to assist at the Pentagon following 11 September. Prior to the partial mobilization authority, an Active Component Infantry unit performed the mission at the Pentagon. Had there not been the partial mobilization authority, it is unclear if an Army Reserve unit would have ever been called.

If all the capabilities of the military are to be made available to civil authorities, U.S. Army Reserve forces and active military forces will need to be made more readily available in the event of an emergency. The legal and mobilization processing bureaucracies are simply too cumbersome to meet time sensitive missions. Additionally, hierarchical command control arrangements such as those seen for the federalized National Guard during the Los Angeles Riots degrade mission readiness and responsiveness. The alternative is to place units likely to be requested by local authorities, such as graves registration units, in the National Guard. However, this would appear to be both expensive and highly turbulent to the Army force structure. Another alternative is to train National Guard logistics units to perform graves registration duties. This seems like an unnecessary activity when the Army Reserve already has units trained and equipped in managing mass fatalities and WMD contamination. Complete reorganization and re-training of the National Guard may not be necessary if other military components can be employed responsively during large-scale consequence management operations.

PROTECTING THE FORCE IN A RADIOLOGICALLY CONTAMINATED ENVIRONMENT

Although radiological contamination may be the least likely battlefield WMD, it is probably the most likely domestic WMD. Radiological defense training may receive less emphasis at the unit level than either chemical or biological defense. Some National Guard radiation detection equipment and dosimeter were developed in the 1950's and 1960s. Although functional, this equipment is very difficult to use especially when one considers the infrequency in which it is operated. The older equipment also requires more calibration and maintenance than modern equipment. Army pen-style dosimeters are so unreliable that soldiers must wear two dosimeters and then take the lower reading.[68] Further, pen-type dosimeters are not issued on an individual basis because battlefield operations allow for radiation level monitoring on the platoon/squad level.[69] However, in domestic operations soldiers may be operating independently of a squad at checkpoints or while driving vehicles. Modern pager-style dosimeters are more reliable and easier to use. Further, they can sound a warning when individuals have reached the radiological exposure limit set for the operation. Other agencies, including U.S. Customs Services, police, and fire departments are purchasing modern digital equipment.

Badge-type dosimeters are also the civilian standard and should be purchased and stockpiled in National Guard armories and Reserve Centers likely to provide forces to an RDD event. Although they do not offer the real-time radiological exposure readings that pager-type

dosimeters offer, they are inexpensive enough to allow wear by every soldier. Also, they offer a redundancy and documentation that real-time pager-type dosimeters do not. Since National Guard soldiers in a state active duty status are not federal medical beneficiaries, the National Guard should contract with a laboratory to provide badge readings, analysis, tracking and referrals for medical surveillance and bioassays. If practical, contracting with the U.S. Army offers the advantage of allowing the entire force being surveyed by one organization. State run programs, for soldiers and airmen on state active duty, do not account for the fact that soldiers participating in the operation may come from several states and that there is a need to have federal visibility in tracking lifetime exposure limits to meet future mission requirements.

The Army should consider the purchase and stockpile of civilian style (tyvex) protective outer garments (including rubber boots and gloves). These suits are well suited for radiological protect at a fraction of the price of scarce tactical chem-bio suits which were not designed for radiological contamination. The Medical NBC Battlebook recommends two pair of cotton overalls to protect against radiological contamination.[70] However, civilian suits are less expensive, more readily available, and can be purchased with gloves and protective over boots. They also offer the advantage of being disposable and water resistant. Soldiers may feel more confident if they are wearing the same protective equipment as other emergency responders. The Purchase of inexpensive civilian protective garments would allow frequent rotations out of the area of contamination and frequent decontamination of the force, thus reducing harmful exposures.

In summary, current measures for force protection during battlefield operations in a radiological contaminated area are not sufficient for homeland security operations. Equipment available at the unit-level is not up to date compared with other emergency responders. Further, the Army's radiation documentation and medical surveillance program is only available to soldiers on a federal duty status. Most military responders will be on a state active duty status.

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Although this paper is not intended to be a comprehensive analysis of the readiness of the force to support WMD consequence management, it does provide a model that produces more specificity in assessing readiness and formulating recommendations than the broad generalizations that have dominated the readiness debate. In this example, the RDD scenario examined the probability and impact of the event. From that scenario, analysis revealed at least

two missions that are not traditional to either past consequence management scenarios or battlefield operations. Namely, conducting personnel radiation surveys and decontamination for large urban populations and the retrieval and disposition of contaminated human remains. In the case of the first mission, surveys of civilian populations, it was revealed that battlefield radiation detection equipment might not be efficient in conducting the large number of personnel surveys prediction in the scenario. In the case of the second mission, retrieval and disposition of human remains, it was revealed that units specialized in that operation exist in the Army Reserve, not the National Guard. Although force structure transfer of units, or National Guard training might address this apparent shortfall, a more efficient solution may be to streamline the legal and bureaucratic constrains to domestic federal mobilization. In both cases, it was revealed that there are some inadequacies in current structures, training and equipment. However, they are not insurmountable. Although limited in scope, scenario-based analysis reveals that there is no need for wholesale re-missioning and reorganization of the National Guard.

In addition to determining the unique missions of WMD consequence management, scenario-based readiness assessments should be used to evaluate if force protection measures developed for the battlefield environment translate into adequate protection for domestic/civilian WMD consequence management. In this case, they did not. There are no adequate protective over-garments for large-scale operations in a low-level radioactive environment. The Army's recommendation to use two sets of cotton overalls in a military environment is neither practical nor appropriate for this environment. Soldiers should be afforded the same level of protection as civilian emergency personnel. Perhaps more disturbing is the lack of an organization-wide medical surveillance program for soldiers and airmen on state active duty. Failure to rectify this situation could result in unnecessary health risk to soldiers simply because they were called to state active duty instead of T-10 or T-32 federal duty.

The probability of an RDD legitimizes the planning and programming effort necessary to achieve a higher state of readiness. However, to date, there has been little effort to develop new programs and processes or to purchase and stockpile equipment and supplies unique to the consequence management mission. Although high profile military units such as CST-WMD receive funding from Congress, traditional military units have not benefited from homeland security resourcing or training. The goal should be to find a balance between traditional military missions expressed in the National Military Strategy and the missions assigned to DOD in the Homeland Security Strategy. If properly identified and prioritized, resources and reforms to enhance mission readiness for emerging homeland security missions do not need to come at

the expense of traditional military missions. With meaningful scenario-based analysis, resources can be assigned to specific priorities to meet higher probability consequence management events.

RECOMMENDATIONS

1. The DOD and National Guard Bureau (NGB) pursue scenario-based consequence management modeling to determine the readiness of the force and to prioritize equipment purchases and training requirements.

2. Mobilization of the National Guard and Reserve force under T-10 be streamlined.

3. Federal military command and control structures for support to civil authorities be modified to allow local decision making and flexibility in meeting mission requirements.

4. The DOD evaluate tactical radiation detection equipment and dosimeters to determine if they are adequate for the domestic consequence management mission and environment. The review should include an assessment of the effectiveness and cost of digital radiation detectors, pager-type dosimeters, stockpiling of badge-style dosimeters at National Guard armories and Reserve Centers, and the practicality of walk-through portal radiation detectors to screen large numbers of civilians in a short period of time.

5. DOD purchase and stockpile low cost civilian protective over-garments in National Guard armories and Reserve Centers.

6. NGB establish a single radiological medical surveillance system that can be used by all members of the National Guard regardless of duty status or state affiliation. The system should include civilian radiological badge reading and analysis, protocols for bioassays referral, and a database to track lifetime exposure and determine availability for future federal and state missions that may involve radiological contamination.

WORD COUNT= 9,034

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